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ABSTRACT

The impact of financial aid in helping a student stay in college is examined from data collected in 1972 from students who entered college in 1968. The findings include: (1) Students, especially men, who rely on loans for support during college increase their chances of dropping out. (2) Students who rely on scholarships or grants increase their chances of completing college, but only slightly, while students relying on savings or the G.I. bill increase their chances of dropping out. (3) Participating in work-study programs increases chances of completing college, particularly among students from middle-income families. (4) Students who receive support for college expenses from their parents are more likely to complete their education. (5) Students who are married when they enter college have a good chance of completing their education if their spouses provide major financial support, but dropout chances are substantial if spouses provide no support or only minimal support. (6) Any type of financial aid administered alone is more effective than financial aid packages. (LBH)

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Financial Aid and Student Persistence

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The Disappearance of Sex Discrimination in First Job Placement of New PhDs

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Financial Aid and Student Persistence

Student financial aid programs have provided the basis for much recent public controversy at state and national levels. Debates have focused on a number of issues: How much money should be appropriated? How should available resources be allocated among different types of aid (loans, grants, and work-study programs)? Should aid be administered through the institutions, or should it be available directly to students? Should it be distributed to encourage students to choose particular types of colleges (e.g., private rather than public)? Should aid be based primarily on financial need, or should other criteria (e.g., student aptitude) be used? How is financial need to be defined? How should various forms of aid be packaged for individual students?

Such controversies are difficult to resolve because the *purposes* of student financial aid programs are often not explicit. Among the many possible uses of financial aid programs, the most common are to provide greater access to higher education for students, to assure that students complete their studies, to provide an incentive for students to perform well academically, to reward merit, to influence student choice, and to redistribute wealth.

The use of financial aid to enhance student persistence in college will be the focus here. Analyses are designed to determine if the type and amount of aid and the conditions of its administration have any effect on the student's chances of completing college.

On the surface, one might expect that *all* forms of financial aid enhance student persistence, since financial problems are among the reasons most commonly given by dropouts for leaving college. If such explanations are valid, any type of financial aid, regardless of source, should reduce the student's chances of leaving college for financial reasons and, thus, positively affect student persistence.

Method for Determining Impact

The dependent variable (student persistence versus dropping out) was calculated from longitudinal follow-up data collected in 1972 from stud-

ents who started college in 1968. Persisters included all students who, at the time of the follow-up, satisfied one or more of the following conditions: (a) was enrolled in graduate or professional school, (b) had a bachelor's degree, (c) was still enrolled as an undergraduate and still pursuing the bachelor's degree, (d) never left college since 1968 and was still pursuing the bachelor's degree, or (e) had completed four years of undergraduate work.

With data from the Cooperative Institutional Research Program (CIRP), sponsored jointly by the American Council on Education and the University of California, Los Angeles, it was possible to compute the expected probability of dropping out using measures of each student's ability, grades, study habits, aspirations, and other personal background characteristics. Since the battery of student predictors obtained when students entered college as freshmen in 1968 also included information on the students' marital status, family education and income, and concern about college finances, presumably these expected probabilities take into account initial differences in financial need.* If a particular form of financial aid has a positive effect on student persistence, the actual dropout rate for students who receive that aid should be lower than the expected rate based on the student's background characteristics.

One problem with assessing the effects of any variable such as financial aid is that most variables do not occur in isolation; other environmental factors can also influence student attrition. For example, students who attend highly selective private colleges are somewhat more likely to receive scholarships or grants than students who attend public community colleges (Astin et al., 1974). If selective private colleges, in turn, have better holding power on their students than public community colleges, failing to consider college type might produce a spurious "effect" of scholarships or grants which is, in reality, an effect of college type. A similar confounding of environmental variables could involve financial aid and student residence (scholarship recipients are probably more likely than nonrecipients to live in dormitories), or financial aid and work (scholarship recipients are probably less likely than nonrecipients to have jobs while attending college).

To control such biases, the battery of predictors includes not only the student characteristics, but also several additional environmental measures covering three general categories: residence, work, and college characteristics. *Residence* predictors include dichotomous measures of three

* Formulas for computing these expected probabilities were obtained from stepwise multiple regression analyses in which dropping out versus staying in college was used as the dependent variable. Predictors from a battery of 110 freshman variables were permitted to enter the regression equation until no additional predictor was capable of producing a significant reduction in the residual sum of squares. Samples included 41,356 students attending a stratified national sample of 358 institutions. Regressions were weighted to simulate the total population of 1968 first-time, full-time freshmen. Students who aspired to less than a bachelor's degree at college entry (11.4% of the sample) were excluded. Regressions were done separately on black students in black colleges (N=1,378), blacks in white colleges (N=1,761), nonblack women (N=17,074), and nonblack men (N=18,069).

types of residence during the freshman year: college dormitory, parents, and private room or apartment. *Work* predictors include three dichotomous measures of work activities during the freshman year: on-campus work (other than federally sponsored work-study programs), off-campus work, and employment for college credit as part of a departmental program. Measures of *college* characteristics include enrollment size, selectivity (an estimate of the average academic ability of the entering freshman; see Astin, 1971), percentage of men students, percentage of undergraduate students, coeducational versus single sex, control (public versus private), and type (three measures: two-year college versus four-year college versus university). Except as noted below, all analyses of the impact of financial aid programs utilize expected dropout probabilities based on these additional environmental characteristics, as well as the student characteristics. The multiple correlations of these student and environmental characteristics with dropping out were .44 (blacks in black colleges), .59 (blacks in white colleges), .42 (nonblack women), and .44 (nonblack men).

Even though these additional predictors give a less biased estimate of the impact of financial aid, such estimates tend to be somewhat conservative. By controlling all other environmental experiences that might be associated with receipt of financial aid (i.e., work, residence, and college type), the *shared* effects of aid and these other variables are eliminated. Thus, if scholarship recipients are concentrated more in four-year than in two-year colleges, some but not all of the effects of scholarships on attrition will be washed out when college characteristics are included in the calculation of expected dropout probabilities. The greater the degree of overlap (i.e., between scholarship aid and these other environmental variables), the more conservative the estimate. The only condition under which all the effects of scholarships would be washed out by such an analysis occurs when every scholarship recipient attends only one type of college. This condition never obtains with any of the financial aid measures.

Financial Aid Measures

Undergraduates usually pay their college costs through one or a combination of five different sources of aid: family (parents, spouse), scholarships, loans, savings, and work. Since savings often come from previous employment, these two categories can be combined. Thus, the principal measures of financial aid cover personal savings and/or employment, parental or other family aid, repayable loan, and scholarship, grant, or other gift. These four items were presented to the entering freshmen participating in the CIRP in 1968 with the question, "Through what source do you intend to finance *the first year* of your undergraduate education?" Students were asked to indicate whether each item was a major source, a minor source, or not a source.

This analysis is limited primarily to the first year in college. While it would be useful to know the effects of financial aid after the first year, studies are difficult if the outcome variable is student attrition. Once a student drops out of college, receiving any form of financial aid is precluded. Even if financial aid subsequent to the freshman year has no causal relationship to attrition, there would be a built-in negative association between such aid and attrition simply because only those who stay in college would receive it. This problem of the possibility of artifactual effects after the freshman year will arise on several occasions.

In addition to the four financial aid items from the 1968 freshman questionnaire, a number of more detailed items were used from the follow-up questionnaire in 1972. The instructions for these questions read: "For each item below, indicate the extent to which it has been a source for financing your *undergraduate* education (include costs for both academic and living expenses)." Students were instructed to answer each item in terms of one of three alternatives: major source (50% or more), minor source, not a source. The items were support from parents or relatives, support from spouse, fellowships or scholarships (federal, state, school or university, private foundation or organization, industry or business, other), loans (federal, state, commercial, other), withdrawals from savings or assets, GI benefits, ROTC benefits, and other sources.

Sections below will focus on the impact of six categories of financial aid: parental support, support from spouse, scholarships and grants, loans, work-study programs, and miscellaneous sources (GI bill, ROTC, savings). A concluding section will treat combinations of various aid sources known as financial aid "packages."

Parental Aid

Students rely on parental aid far more than any other single source. For nearly 65% of the white women, parental aid is a major source of support for their freshman undergraduate year, while only 16% receive no parental support. For 47% of the men, parental aid is a major source, while for only 28% it is not. Blacks are somewhat less likely than whites to rely on parental aid: only 33% depend on parental aid for major freshman support.

The expected and actual dropout rates (in percentages) for white men and women are shown in Table 1, separately by degree of dependence on parental aid during the freshman year.

Relying on parental support has a small but statistically significant positive effect on the student's ability to persist in college. For men, major parental support (versus no support) reduces dropout chances by about 2%. For women, the comparable reduction is about 4%. These figures illustrate dramatically the importance of controlling for differences in the student's initial propensity to drop out. (Another statistical

problem with such controls is error of measurement in the freshman predictor [control] variables. This error results in an underestimation of the effects of the predictors. A number of supplementary analyses were conducted to assess the possible impact of measurement error. For details, see Astin, 1975.) The difference in actual dropout rates for men

Table 1
Expected and Actual Dropout Rates for White Students, by Sex, 1972

	Men		Women	
Parental Aid	Expected Dropout Rate	Actual Dropout Rate	Expected Dropout Rate	Actual Dropout Rate
Not a source	42	43	39	42
Minor source	39	40	31	32
Major source	33	32	29	28

favors those who depend on parental support as a major source by about 11%. For women, the comparable difference in actual dropout rates is still larger: about 14%. Without the accompanying expected dropout rates based on entering student characteristics and other environmental variables, one might conclude that the significance of parental support during the freshman year is much greater than it actually is. In other words, the differences in dropout rates among students with differing parental support for the freshman year can be attributed primarily to factors other than parental aid per se.

The actual and expected dropout rates for students with differing parental support were calculated separately for various types of colleges. The results are entirely consistent—small positive effect on persistence—for students in two- and four-year colleges, both public and private. Among students attending universities, however, particularly private universities, reliance on parental support appears to affect persistence *negatively*. This effect is especially pronounced among those students for whom parental aid is a minor source of freshman support. Compared with those who have no parental support these students have dropout rates about 8% higher than expected. The high cost of attending a private university may be one explanation. Those who attend private universities may be handicapped in competition for financial aid if their parents provide some, but not all, of the support necessary to meet college expenses. Conceivably, students with no parental support find it easier to demonstrate the need that permits them to take full advantage of the financial aid available.

Additional analyses by level of parental *income* produced some interesting interaction effects. For women, on the one hand, the positive effect of parental aid was clear-cut among those in low-income (parental

income below $10,000) and middle-income (between $10,000 and $20,000) brackets, but *reversed* for those in high-income (greater than $20,000) brackets. For men, on the other hand, the benefits of parental support were strongest within the high-income group, with decreases of about 10% in dropout chances. One possible factor here is that high-income women who receive no parental aid are a highly select group (less than 4% of the total group); high-income men who receive no parental support are somewhat less select (about 7% of the group).

Does parental aid beyond the freshman year have an impact? An item similar to one on parental support on the freshman questionnaire was included in the 1972 follow-up. However, the follow-up item inquired about sources of support for the student's *entire* undergraduate education, rather than just the freshman year. As expected, the percentage of students who reported parental aid as a minor source is somewhat higher on the follow-up than on the freshman questionnaire, indicating that about 6% of the students who receive no support during the freshman year do receive some during subsequent years. The differences between expected and actual dropout rates based on the follow-up item are somewhat larger: about a 10% reduction in dropout rates for both men and women who receive parental aid compared with those who do not. The differences in impact between minor and major sources are negligible. Continuing parental support beyond the freshman year appears to enhance the student's chances of finishing college. For black students attending white colleges, parental aid as major support is clearly associated with persistence. For them, the decrease in dropout probabilities is 12% compared with those who have no support and 17% compared with those who have only minor parental support. The comparable reductions for students attending black colleges are a negligible 1%. Parental support is not critical for students attending black colleges but a major factor for black students attending white colleges. Without major parental support, these black students have a substantially reduced chance of finishing.

Support from Spouse

Although married students constituted less than 2% of the entering student population in 1968, the effects of financial support from spouses are important. Of the men who are married when they start college, 55% have wives who provide financial support for college expenses, and four in five of these wives provide major support. Figures for women are even more striking. Seventy-one percent have husbands who provide support for college expenses, and better than four in five of these husbands provide major rather than minor support. Thus, married persons—women in particular—who enter college depend heavily on their spouses for financial support.

Because of the relatively small numbers of married black students, the analysis of spousal support is confined to white students. Expected and

actual dropout rates for married students who receive spousal support contrast sharply. If the spouse provides major rather than no support, the reduction in the student's chances of dropping out is dramatic: 28% for men and 15% for women. However, if the spouse provides only minor support, the impact is *reversed:* dropout rates for men and women *increase* by 30% and 8%, respectively. While these findings are based on relatively small samples (approximately 50 married men and 50 married women reported minor financial support from their spouses), the dramatic contrast cannot be attributed to chance variations.

Why is the effect of minor spousal support apparently negative? Such support may indicate that the spouse has an uncertain employment situation. On a more subtle level, spouses who are ambivalent or resentful about their partner's attending college may provide only sporadic or little support. Whatever the explanation, providing only minor support may create uncertainties or conflicts that militate against completing college. If nothing else, married students might be well advised to reach a clear understanding about financial support from their spouses before they finalize plans to enroll in college.

How does spousal support affect persistence among students who get married after entering college? To explore this question, the actual and estimated dropout rates were tabulated for the one student in six who married as an undergraduate. As expected, these students rely less on their spouses for support than students who are married when they enter college. While the percentage for the two groups is the same—54%—the majority of those who marry after entering college (better than two in three) receive only minor support from their spouses. Similarly, among the 60% of the women who rely on their husbands for support, nearly two in three receive only minor support. Apparently, most students who marry in college continue to rely on other sources, only infrequently shifting to the spouse as a major source.

Both groups substantially improve their chances of finishing college if they are able to rely on their spouses for financial support. Compared with students whose spouses are not a source of support, those with major support have a much better chance of finishing college: a 15% and 18% increase, respectively, for men and women. Even minor (compared with no) support is beneficial: a 14% and 20% increase, respectively, for men and women. Clearly, the unwillingness or inability of the spouse to provide financial support, no matter how substantial, is a negative prognostic sign for college students who contemplate marriage before completing their undergraduate work.

Scholarships and Grants

Although scholarships and grants are the most coveted financial aid, only about a third of the white students (31% of the men and 36% of the

women) receive this support for their freshman expenses. About equal numbers receive major and minor support. Scholarships and grants are much more frequent support sources for black students: among blacks attending black and predominantly white colleges, 54% and 53%, respectively, receive scholarships or grants during their freshman year.

Scholarships provide the recipient with only a slight advantage over the nonrecipient. These positive effects are small for men (3% reduction in dropout probabilities) and negligible for women (less than 1%). Once again, the results strongly justify the use of expected dropout rates: compared with students who have no scholarships, those with major support have substantially higher dropout rates: 12% and 9%, respectively, for men and women. Differences in the expected dropout rates, however, are almost as large: 9% and 8%, respectively. In short, the observed differences in dropout rates among students receiving differing amounts of scholarship support can be attributed largely to factors other than the scholarship.

Analyses of the effects of scholarship or grant aid by income level of the students' parents again produced some interesting interactions. Among the men, the positive effects of scholarships and grants are clear-cut among those middle-income families: about 3% reduction in dropout chances associated with minor grant support and 5% with major support. Among the women, the positive effects appeared confined to those in the low-income group. Among men in the high-income group, major grant support is associated with a reduction in dropout rates of 9%, but minor support is accompanied by an *increase* of 10%.

Do these borderline results apply to all forms of scholarship support, or are differences associated with a particular type of grant? The follow-up provides an opportunity to estimate the impact of six different types of scholarship support. However, a word of caution is in order: Since the students responded to the questionnaire in terms of their entire undergraduate education, some students may not have received their initial scholarships until after the freshman year. Among those who begin college without any scholarship aid, students who drop out early lose any chance for receiving a scholarship. Those who stay in college remain eligible for such aid if they remain studious. Under these circumstances, a correlation between dropping out and specific forms of financial aid could be simply an artifact of differences in opportunity between dropouts and persisters, rather than the result of a causal relationship between scholarship aid and persistence. In short, data from the follow-up which suggest a negative effect of any form of aid on persistence should be regarded as strong evidence of a causal relationship, whereas data suggesting a positive impact must be viewed with considerable caution.

By far the most common sources of scholarships and grants are state governments and institutions. Although about one in six men and women receive support from these sources, for about two-thirds of the recipients, these are minor rather than major sources. Both forms of scholarships are

associated with student persistence. As with freshman scholarship support, the impact appears somewhat greater for men: the average reduction in dropout probabilities associated with these scholarships is 8% and 4%, respectively, for men and women. Again, these results should be interpreted with caution, particularly for institutional scholarships, which are frequently awarded after the freshman year.

Nine percent of both sexes receive educational opportunity grants from the federal government. However, 54% of the men receive major support from their federal grants, compared with only 32% of the women. This discrepancy is consistent with the finding that men receive substantially larger scholarship stipends than women (Astin & Christian, 1975).

To relate federal grants and attrition: Men who receive minor support from these grants show a moderate reduction in dropout chances (7%) compared with men who do not have grants, but men who receive major support from their federal grants show no such advantage. Among the women, both major and minor federal grants are associated with a 5% reduction in dropout probabilities. Again, these findings must be viewed with caution, since students who do not receive federal educational opportunity grants during their freshman year are still eligible in subsequent years, if they remain in college.

Approximately 6% of the men and 9% of the women receive private foundation grants while in college. These are apparently much smaller than grants from public and institutional sources, since for about 80% of the recipients they provide only minor support. Data on expected and actual dropout rates provide a consistent picture: receiving foundation grants is associated with modest reductions in dropout probabilities (4% for men and 6% for women). Since most foundation scholarships are probably awarded at the time the student enters college (e.g., the National Merit Scholarships), a spurious effect seems less likely here than with institutional, state, and federal grants.

Scholarships from business or industry support 4% of the men and 2% of the women. Compared with other scholarship support, a scholarship from a business or industrial firm is *negatively* associated with college persistence. Thus, compared with students who do not have such scholarships, those who receive major support from business or industry have increased dropout probabilities of 12% and 6%, respectively, for men and women. Why these scholarships should be negatively associated with college persistence is unclear. Recipients may sometimes leave college to work for the sponsoring firm, or they may attend specialized institutions with poor holding power. The conditions of such scholarships may involve alternate periods of full-time undergraduate study and employment with the sponsoring business or industry. This latter explanation may be deficient since similar results are obtained when the analysis is repeated with a more stringent definition of dropping out (i.e., when stopouts are included among persisters). If students are merely stopping out for periods of work, including the stopouts among the persisters rather than

among the dropouts should reduce this apparently negative effect. However, working at jobs as part of an academic program is related to dropping out.

The final source of scholarship aid is a catch-all category: "other scholarships, fellowships." Since only about 5% of the students receive support in this category, the other categories appear to cover most major sources of scholarship or grant support. Results here are mixed. Men with major or minor support and women with minor support have a decreased dropout probability of about 7%. Women with major support (less than one in five) have an *increased* dropout probability of about 10%. Such anamolous results defy explanation, although they do suggest that the *amount* of scholarship support from private sources bears substantially on the student's chances of finishing college. However, since scholarships in this category are an unknown quantity (many could have been awarded after the freshman year), the results should be treated with caution.

Expected dropout rates provide insights into how scholarship or grant aid is awarded. On the one hand, if scholarships are awarded on merit, the expected dropout rates of scholarship recipients should be low (i.e., the more academically able student has a relatively small chance of dropping out). On the other hand, if scholarships are awarded for need, the recipients should have higher expected dropout rates or, at a minimum, rates not appreciably different from those of nonrecipients. Overall, merit seems a more important criterion than financial need: expected dropout rates of freshman recipients are about 10% lower than those of nonrecipients. Expected rates for those whose scholarships are a major support source are not appreciably different from those whose scholarships provide only minor support. This pattern changes somewhat, however, when the data for scholarship aid as reported on the 1972 follow-up are examined. Here the expected dropout rates are lowest among the students for whom scholarships are a *minor* source of support. Students with no scholarship support have expected dropout rates roughly equal to those of students whose scholarships are a major support source.

These findings are probably due to several factors: First, the lower expected dropout rates of scholarship recipients as a group suggest that scholarships are awarded in part on merit. Second, the higher expected dropout rates among major compared with minor recipients reflect the greater dropout propensity of students whose financial need is sufficient to qualify them for larger awards. In other words, students with greater financial need are probably more dropout prone to begin with. Finally, the lower expected dropout rates among students with minor scholarship support may be evidence of the artifact above: The longer students stay in college, the greater the probability that they will be able to avail themselves of scholarship aid. If such aid is secured late in the student's undergraduate career, it counts for only a minor portion of college costs. If this explanation is valid, it underscores the necessity to interpret any results based on the follow-up with caution.

Analyses of scholarship support and persistence among black students also produce somewhat inconsistent findings. In the black colleges, students with major grant support have a somewhat reduced (4%) chance of dropping out. Receiving minor grant support, however, is associated with a 5% *increase* in dropout chances. For blacks attending white colleges, the situation is reversed: minor grant support is associated with an 8% decrease in dropout probabilities, while major support is associated with a small increase in dropout chances (1%). This latter finding confirms the recent study by Baber and Caple (1970) which showed a facilitative effect of scholarships among blacks attending a predominantly white university in the Midwest. While these data on blacks are difficult to rationalize, they suggest that the *amount* of scholarship aid may be critical to the black student's chances of completing college.

Loans

From the standpoint of public policy, loans represent one of the most controversial sources of financial aid. Proponents of loan programs are attracted by the relatively low cost, arguing that limited sources of aid can be made available to many more students if they are heavily concentrated in loan programs. Some critics object to burdening students with long-term debts, while others point to allegedly high default rates.

Two recent studies have produced equivocal results on the effects of loans. Blanchfield (1971) reported that the percentage of costs financed by loan support is not related to persistence. Trent and Medsker (1967) reported that students who *seek* loans are more likely to stay in college; their findings, however, are subject to the artifact above (i.e., that the longer a student stays in college, the greater the chances for that student to seek a loan).

Students entering college in 1968 relied somewhat less on loans than on scholarships or grants. Less than one student in four (21% of the men and 24% of the women) received loans to support their college expenses during the freshman year. For approximately three recipients in five, loans constitute a major source of support.

For men, depending on loan support during the freshman year has a consistently negative effect on persistence. On the average, reliance on loan support increases a man's chances of dropping out by about 6%. This effect occurs, regardless of whether the support is major or minor, in all types of institutions. (It is pronounced in the private two-year colleges, where reliance on loans appears to increase men's dropout rates by about 15%.) The effect is especially clear-cut among men in the lower- and middle-income levels: results for men in the highest income level are indefinite because of the small number.

The picture for women is less consistent. In general, women who rely

on loans as a major source of support, when compared with women who have no loan support, have slightly increased chances of dropping out (about 2%), particularly if their parents are in the middle-income bracket. Reliance on loans as a minor source, however, appears to have a *positive* impact on persistence (6% reduction in dropout rates) for women attending public institutions, whether universities or four- or two-year colleges. Reliance on loans as a minor source has a slightly negative effect on persistence among women at private institutions. Assuming that minor support at a private institution involves larger amounts than at a public institution, it appears that the *amount* of the loan is critical to the persistence rates of women. Small loans appear to benefit undergraduate women, but larger loans seem to present a handicap to completing college. Men, however, appear handicapped by loans, regardless of size.

The picture for the impact of loans on black students is also somewhat mixed. While loans have no consistent effect on persistence among blacks attending black colleges, they appear to be an asset for black students at predominantly white colleges. For this latter group, reliance on loans as either a major or minor source of support for the freshman year is associated with an 8% reduction in dropout rates.

The loan items from the four-year follow-up questionnaire indicate that the highest proportion of students (20%) rely on federal loans, followed by state (9%), commercial (9%), and "other" loans (4%). The relationship of these items to attrition is not consistent with the above results for loans during the freshman year. Loans (and particularly state loans) tend to be positively associated with persistence, especially among women. In all likelihood, this association is not causal but rather an artifact. Thus, the longer a student is able to remain in college, the greater the opportunity to secure a loan. That students were much more likely to report loans as a minor source of support on the follow-up than on the freshman questionnaire supports this interpretation.

To speculate on the negative impact of loans on persistence among men: Since estimates of dropout probabilities control for differences in financial need, such as family income and concern about college finances, one might expect men who secure loans to have an easier time getting through college simply because they have additional resources. But precisely the opposite occurs. Apparently, any short-term financial advantage associated with securing a loan is outweighed by other, possibly psychological, factors. Do men who begin college dependent on loans quickly become disenchanted with the prospect of long-term indebtedness, once indebtedness from the first year becomes a reality? For some men, leaving college may be a more desirable alternative than incurring further indebtedness. Whatever the reasons, the psychological and motivational aspects of loans and indebtedness merit careful consideration in the development of future financial aid policy.

Work-Study Programs

Although work-study programs may be considered a form of work, certain work-study findings are presented here because these programs have been a major part of federal financial aid policy since the Higher Education Act of 1965.

During their freshman year (1968-69), 3% of the men and 6% of the women participated in federally sponsored work-study programs. By the time of the four-year follow-up in 1972, 9% of the men and 13% of the women had participated. For more than 75% of these students, work-study provides only minor support for their college expenses.

Analyses of expected and actual dropout rates indicate that participation in work-study programs during the freshman year results in a small but significant increase in student persistence (2% and 6% reduction in dropout rates for men and women, respectively). The follow-up suggests that participation in work-study at any time during the undergraduate years is associated with somewhat larger reductions in dropout rates: 8% for men and 11% for women. The significance of these larger rates is, of course, open to some question because of artifacts.

Data by parental income level suggest that positive effects of federal work-study programs are most likely to occur among students from middle-income levels. The impact of work-study among black students is much more striking. Blacks are not only more likely to participate in work-study programs during the freshman year (11% from black colleges and 12% from predominantly white colleges), but participation is also associated with a more substantial reduction in dropout rates: 14% in black colleges and 9% in predominantly white colleges.

Work-study programs are an attractive form of financial aid. Such programs not only offer productive work, but also increase the student's chances of completing college. These positive effects might be attributed to the greater degree of student involvement in campus life which may result from participation in work-study programs. These apparently facilitative effects are reinforced by the finding that virtually all other forms of work during college are positively related to persistence (Astin, 1975).

Other Forms of Aid

One financial aid item from the freshman questionnaire, "personal savings and/or employment," covers a number of sources, including money earned by the student from earlier employment, inheritances, work-study, and other employment. Seventy-four percent of white men and

63% of white women finance their freshman year in part by such funds. For about half the men utilizing this source, the funds provide major support, whereas they constitute a major source for less than one-third of the women. Fewer blacks depend on such funds as either a major or minor source: 53% in predominantly white colleges and 38% in black colleges.

Again, analysis of expected and actual dropout rates produces a mixed picture: For white women, the effects of dependence on this source during the freshman year are generally negative, associated with increased dropout rates of about 2%. These negative effects are much more pronounced for women attending public and private two-year colleges, where the average increase is about 6%. In direct contrast, white men at two-year colleges who rely on this source during the freshman year have an average *decrease* in dropout probabilities of about 5%. Men at public four-year colleges and universities *increase* their chances of dropping out by about 4%. While it is difficult to explain these discrepancies, that this category includes support from many sources may account in part for the varied results.

Further clues to the possible impact of reliance on savings are provided in the follow-up questionnaire, which contains an item mentioning savings, "withdrawals from savings, assets," as distinct from employment or other aid sources. Both men and women rely heavily on this specific support (39% and 35%, respectively). For about one-fourth of those, these funds provide major support for undergraduate expenses. Reliance is associated with *increased* dropout rates among both men (7%) and women (4%). Reliance on savings as a minor source, by contrast, is associated with decreased dropout rates (3% for men and 4% for women).

Among blacks, reliance on savings or assets as a major source of support also has a pronounced negative effect on persistence at predominantly white colleges (an increase in dropout probabilities of 29%). No effect is observed among blacks at black colleges. Several factors may explain these findings. On the one hand, the positive association with minor reliance on savings or assets may result from the artifact: The longer a person remains in college, the more possibilities arise that may require savings or other assets to support college and living expenses. On the other hand, the negative association between major reliance and persistence must be regarded as strong evidence of causal relationship. In all likelihood, entering college students who have substantial liquid resources (savings, trust funds) are ineligible for the usual forms of financial aid. Forced to utilize their assets for substantial support, these students may ultimately view college as unreasonably expensive and see dropping out as a way to conserve assets. Whatever the explanation, these data should be considered in any future attempts to revise standard procedures for defining financial need.

About 6% of the men and 1% of the women rely on GI benefits to sup-

port their undergraduate costs. For 75% of the men, GI benefits provide major support for their college costs, while the same is true for only 60% of the women. This discrepancy probably reflects the failure to distinguish between student benefits from their own military service and *from their parents' service;* presumably, a larger proportion of the women are reporting support from their parents. Among the white men, reliance on GI benefits is negatively associated with persistence: college men who rely on GI funds for major support have an increased dropout probability of about 7%. Among women, minor reliance is associated with increased dropout chances and major reliance with slightly decreased dropout chances; however, the small samples make these findings highly tentative.

Too few blacks at black colleges received GI bill support to derive any estimate of its effects, but among blacks at predominantly white colleges, effects are negative: 8% increase in dropout probabilities.

Why reliance on the GI bill should be associated with dropping out is not entirely clear. Since virtually all veterans entering college in 1968 were eligible for some GI support, veteran status, in effect, has been confounded with GI support. Possibly, the effects of being a veteran are showing up rather than the effects of GI support per se. That the GI group is atypical to begin with is reflected in the expected dropout rates: 58% for men receiving major GI support versus 35% for those receiving none. The comparable percentages for women are 41% and 31%. For blacks at predominantly white colleges, the corresponding expected dropout rates are 70% and 48%, respectively, for GI recipients and nonrecipients. It may well be that veterans, many from the Vietnam war, find it exceedingly difficult to adjust to traditional college life.

A final category of financial aid support is ROTC benefits. About 2% of the white men and virtually no white women receive ROTC benefits. For more than 80% of the recipients, this aid constitutes major support. Men whose ROTC benefits are a major source of support for undergraduate expenses have a substantially reduced dropout rate (14%), compared with students who do not receive ROTC benefits. (Data for blacks are too sparse for reliable estimates.) Participation in ROTC may represent a commitment that greatly decreases the chances that the student will leave college. Among other things, ROTC is contractual: students who receive benefits normally make a commitment to continue in the program and to serve on active duty once they finish college. Whatever the explanation, ROTC programs are "cost effective" in the sense that they are associated with substantially increased probabilities of degree completion. Indeed, even though the expected dropout chances of students receiving major support from ROTC are low to begin with (only 24% compared with 37% for non-ROTC students), their actual dropout rate is much lower (only 9%). Thus, of those students who receive ROTC benefits, whether major or minor, while in college, fewer than one in ten fails to finish college.

Financial Aid "Packages"

The financial aid provisions of the Higher Education Act of 1965 authorize institutions to use financial aid "packages" that combine three basic sources of support: grants, loans, and work-study programs. So far these three forms of aid have been considered separately in terms of their relationship to student persistence. Combinations of these three may also have an impact on persistence. Since dealing with combinations reduces the number of students in each category, only the results of white students are presented here.

Grants and Loans. Receipt of these two forms of aid tends to be correlated. Thus, among students who receive no grant support, only 17% receive any loan support. By contrast, 35% of those who receive either minor or major grant support also receive loan support. Among those who receive no loan support, only 28% receive any scholarship support, compared with 52% among those who receive either minor or major loan support. Approximately 2% of the men and 4% of the women receive major support from both sources. However, among students from low-income levels, the percentages are higher: 8% of the men and 12% of the women.

The positive effect of grants on persistence is most obvious among men with no loan support, and virtually nonexistent among students with major loan support. Dependence on loans, on the one hand, impairs the normally positive effect of scholarships. The negative effect of loans on persistence, on the other hand, is consistent among all groups of men regardless of their status in terms of grant support. However, this negative effect is most pronounced among men who receive minor grant support (about 5% increase in dropout chances compared with men who receive major support or no support from grants).

No clear-cut interactions between grant and loan support are apparent among the women. Receiving minor loan support has a modest positive effect on persistence (about 3%), regardless of the women's grant status. Similarly, grants have negligible effects on persistence regardless of the women's loan status.

Grants and Work-Study. Receipt of grant support is positively associated with participation in federal work-study programs. Only 1% of the men with no grants participate in work-study programs, compared with 5% of those who receive major grant support. The association is even stronger among the women, where only 3% of those with no grants participate in work-study, compared with 13% of those who receive major grant support.

The effects on persistence of participation in work-study seem to depend on the student's grant status. The most clear-cut positive effect occurs among students receiving no grants: decreased dropout probabili-

ties of 4% and 11%, respectively, for men and women. The comparable figures for students receiving major grant support are only 1% and 5%, whereas the effects of work-study are actually *negative* among those receiving minor grant support: an increase in dropout probabilities of 6% for both sexes.

The effects of grant support also appear to depend on students' work-study status. For men and women, any benefits from grant support disappear among students participating in work-study. For men in work-study, major grant support versus no grant has no effect on dropout probabilities, whereas receiving minor support is associated with a 9% *increase* in dropout probabilities. This interaction between grants and work-study is even more dramatic among women. Thus, even though grants have no consistent overall effect, among women on work-study programs, major grant support is associated with a 6% increase and minor grant support with a 15% increase in dropout probabilities.

Thus, grants in combination with work-study may not make effective financial aid packages. In particular, work-study and small grant support may represent an unwise combination of financial aid.

Loans and Work-Study. Participation in work-study programs is positively associated with dependence on loan support. Only 1% of the men who receive no loan support during their freshman year participate in work-study programs, compared with 6% of those who receive major loan support. The corresponding percentages for women are 3% and 11%.

The effects of participation in work-study appear to depend heavily on the student's loan status. For the student receiving major loan support, participation reduces the chances of dropping out (13% for men and 5% for women). However, participation appears to have a negative effect on persistence (10% *increase* in dropout rates for both men and women) if the student receives only minor loan support.

Grants, Loans, and Work-Study. Receiving all three forms of financial aid is closely associated with the income level of the students' parents. Among low-income students, 1.3% of the men and 3.8% of the women receive some support from grants, loans, and work-study programs during the freshman year. Comparable percentages among middle-income students are 0.3% and 1%, respectively, for men and women; among high income students, less than 0.1% receive support from all three sources.

Because of the small numbers of students involved, it is possible to examine the simultaneous impact of these three sources of aid only among students from low-income families. Receiving support from federal work-study programs seems to increase persistence most (8% for men and 18% for women) when the low-income student has *neither* grant nor loan support during the freshman year. But work-study is associated with increased dropout rates (6% for men and 10% for women) if the low-income student has major grant-support coupled with minor loan support. How-

ever, work-study and major loan support have positive effects on persistence, regardless of the degree of grant support, if any.

The particular types of financial aid which make up any student's package may be important to the ability to complete college. While the complexities and ambiguities of this study underscore the need for more in-depth research on the impact of particular packages, certain preliminary generalizations seem warranted.

First, grants in combination with loans do not make particularly effective financial aid packages. In particular, a combination of small amounts of grant and loan support seems unwise. Second, a combination of work-study programs with small grant or loan support is also not recommended. Third, the most effective combination appears to be substantial loan support and work-study.

Conclusions

The evidence indicates that the source and amount of financial aid can be important factors in the student's ability to complete college. Although many of the findings must be regarded as tentative because of data limitations, several general conclusions seem warranted:

1. Receiving support from parents for college expenses generally enhances the student's ability to complete college. This facilitative effect occurs among students in all income groups, except women who come from high-income brackets. For them, receiving parental support appears to contribute negatively to college persistence.

2. Students who are married when they enter college persist better if their spouses provide major support for their college costs. If the spouse is only able to provide minor help, however, the effect is reversed, and the student is better off having no support. Among students who marry after entering college, assistance from the spouse facilitates persistence, regardless of the amount.

3. Scholarships or grants are associated with small increases in student persistence rates. These beneficial effects are confined largely to women from low-income families and to men from middle-income families. The *amount* of the grant support appears to be a major factor in student persistence, particularly among black students.

4. Reliance on loans is associated with decreased persistence among men in all income groups. Among women, the effects are highly variable, depending upon the amount of the loan and the income level of the parents. Reliance on loans is associated with increased persistence among black students attending predominantly white colleges.

5. Participation in federal work-study programs seems to enhance student persistence, particularly among women and blacks. Work-study has its most consistent positive impact among students from middle-income families.

6. Reliance on savings or other assets appears to decrease the student's chances of finishing college. This effect was observed among both men and women, and among blacks attending predominantly white colleges.

7. Reliance on GI bill support is negatively associated with student persistence, although the confounding of such support with being a veteran makes it difficult to determine whether this aid as such is related to persistence.

8. Support from ROTC stipends is strongly associated with increased student persistence.

9. Analyses of various financial aid packages involving combinations of grants, loans and work-study produced findings that may have important policy implications. In general, any form of aid appears to be most effective if it is *not* combined with other forms. This is particularly true of work-study programs, which tend to lose their beneficial impact when combined with grants or loans. This loss is especially marked among low-income students. Similarly, grants are most effective if the student has no loan. The only combination associated with greater persistence is work-study and major (rather than minor) loan support.

Policy Implications

Because this study focuses intensively on the single outcome of student persistence in college, the following suggestions and recommendations are based implicitly on the assumption that decision-makers want to minimize students' chances of dropping out. It goes without saying, of course, that almost any decision must simultaneously weigh other outcomes for which no data are presented here: for example, other aspects of the student's development (satisfaction with the college, knowledge gained from the educational experience, and so forth), as well as the relative cost of different alternatives and programs, possible side effects of each, and the constraints operating in the decision process. The consumer of these findings need not necessarily assume that dropping out is always detrimental to all students. There are cases where the student's personal development is clearly enhanced by leaving college. What this study does assume is that large numbers of administrators, policy-makers and students have a legitimate interest in understanding the financial circumstances that lead a student to drop out of college and that they may

wish to alter these circumstances to maximize the student's chances of finishing.

Several qualifications about the following recommendations should be kept in mind. First, the recommendations are not necessarily applicable to all types of students attending all types of postsecondary institutions. The data were obtained from full-time students enrolling for the first time in traditional collegiate institutions. Students who aspire only to an associate degree or to no degree were excluded.

Second, some findings may not apply to students who are married at college entry. Although in a few instances it is possible to point to specific factors that influence married students differently from single students, the small number of married students precluded a full-scale separate study of them. In contrast, students were studied separately by sex and race, and all results that apply uniquely to men or women as well as to black or white students are noted.

Implications for Institutional Administrators. Financial aid can be utilized in numerous ways to reduce students' chances of dropping out. However, because of the many constraints imposed on state and federal financial aid money (the bulk of the aid to students), institutions have relatively little discretion in awarding such funds. The current federal Basic Educational Opportunity Grant (BEOG), which for the 1974-75 freshmen represents the most common single source of grant support, is based strictly on an independent determination of student financial need. Many state scholarship programs—the second most likely resource for these freshmen—are similarly outside the control of individual institutions. Perhaps the largest sources of discretionary financial aid for individual institutions are internal funds (such as tuition and endowment income) and funds from the Higher Education Act of 1965: work-study, loans, and grants. Institutions have the responsibility for combining these latter funds to create "packages" of financial aid.

For institutions with some discretionary dollars, several uses can maximize the beneficial impact on student persistence. Where possible, loans should be avoided in favor of other sources, particularly for men. Although grant support is associated with small increases in persistence, it is, of course, an expensive form of aid compared with loans. Work-study programs, universally effective in contributing to greater student persistence, can also be expensive, but there is some return in that useful service is performed by the working student. Work-study appears to have its greatest impact among low-income students when it is *not* combined in a package with grant or loan support.

Institutions should consider financial aid packages cautiously. Modest support from several sources simultaneously is generally associated with somewhat reduced chances of persistence, whereas support from a single source (a loan is the main exception) is generally associated with increased chances of persistence. While the meaning of these findings is not entirely clear, financial aid officers would be well advised to undertake

more systematic research on the effects of different amounts and combinations of financial aid.

Implications for Policy-Makers. Most undergraduate financial aid comes from public funds appropriated by city, state, and federal legislatures. The purpose is basically twofold: to permit more students to attend college and to enable them to earn the degree.

Certainly the most clear-cut finding is the positive impact of student employment on persistence. Participation in federal work-study programs, as well as other on-campus work, benefits both men and women, as well as blacks and whites. (The impact is especially pronounced among blacks at both black and white colleges.) While grants also appear to increase the student's chances of completing college, the effects are generally smaller than for work. Depending on the third major category of financial aid—repayable loans—appears to *decrease* the man's chances of completing college; results for women are inconclusive.

Those who set financial aid policy and determine how resources will be allocated face certain dilemmas. Assuming that they will eventually be repaid, loans represent a relatively inexpensive source of aid, but they are apparently the least effective in enabling students to complete college. Indeed, men appear better off with no aid than with loans. Student employment is the most effective way to maximize persistence, a finding which reinforces other research (Astin, 1975) suggesting that any program that involves the student actively in campus life decreases attrition. Policy-makers who might push for a greater investment of financial aid in expanding student work opportunities should keep in mind these qualifications: first, the place of work. Jobs on campus are clearly superior to off-campus employment, although off-campus employment can be effective if the student is not married, if the work is less than full time, and if the off-campus job becomes part of the student's established pattern of activities during the freshman year. Second, the number of hours worked. More than 20 hours a week, particularly for women, not only eliminates the beneficial effects of jobs, but also reverses the effects to the point where the student is better off not working at all.

Caution should be exercised in developing financial aid packages. Students who depend on more than one source of aid during the freshman year have increased chances of dropping out compared with students who depend heavily on a single source such as grants. In a sense, then, such sources as work-study or grants lose their effectiveness if they are provided in relatively small amounts to make up a total package of aid. Complex interaction among the variables—type and amount of financial aid, need, and college costs—make it difficult to say whether there are ways that various types of aid can be packaged so as to enhance rather than inhibit the student's chances of finishing college. Considering the complexity of the problem and the large sums involved, policy-makers might consider allocating a fraction of such aid to systematic research on these interacting factors. Such research would almost surely provide a better empirical basis for developing future policies.

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